UNIVERSITI TEKNOLOGI MARA

TREATMENT OF DERMATOPHYTOSES BY FILM-FORMING TOPICAL ANTIFUNGAL SPRAY

MOHD FAIZ BIN MUSTAFFA

Thesis submitted in fulfillment
of the requirements for the degree of
Master of Science

Faculty of Pharmacy

March 2016

CONFIRMATION BY PANEL OF EXAMINERS

I certify that a Panel of Examiners has met on 21st October 2015 to conduct the final examination on Mohd Faiz Mustaffa on his Master of Science thesis entiltled "Treatment of Dermatophytoses by Film-Forming Topical Antifungal Spray" in accordance with Universiti Teknologi MARA Act 1976 (Akta 173). The panel of Examiners recommends that the student be awarded the relevant degree. The panel of Examiners was as follows:

Jean Frederic Faizal Weber, PhD
Professor
Faculty of Pharmacy
Universiti Teknologi MARA
(Chairman)

Nor Amlizan Ramli, PhD
Senior Lecturer
Faculty of Pharmacy
Universiti Teknologi MARA
(Internal Examiner)

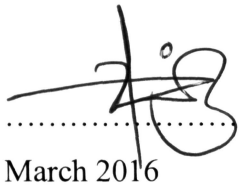
Norazrina Azmi, PhD
Senior Lecturer
Faculty of Pharmacy
Universiti Kebangsaan Malaysia
(External Examiner)

SITI HALIJJAH SHARIFF, PhD
Associate Professor
Dean
Institute of Graduate Studies
Universiti Teknologi MARA
Date : 24th March, 2016

AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of student	:	Mohd Faiz Bin Mustaffa
Student I.D. No.	:	2011680672
Programme	:	Master of Science (Pharmacy) – PH780
Faculty	:	Pharmacy
Thesis Title	:	Treatment of Dermatophytoses by Film-Forming Topical Antifungal Spray
Signature of Student	:	
Date	:	March 2016

ABSTRACT

Dermatophytosis is a major public health problem especially in tropical countries like Malaysia. Several studies report incidence of resistance to common treatment for dermatophytosis with drugs such as terbinafine, fluconazole, and griseofulvin. Resistance arise as consequence of non-adherence with prescribed treatment regimens, repetitive use of antifungal drugs more than once in a patient's life, incidence of reabsorption or washout of drug from the skin and failure of drug to reach the stratum corneum. Currently available antifungal preparations (ointments or creams) are easily removed after application and may contribute to none cure and/or to development of resistance. This project was initiated with the intention of producing an antifungal topical drug delivery system using film-forming polymeric solutions. The research was divided into 4 main areas which are (1) preliminary studies to test antimicrobial activities and determine the cytotoxicity of selected antimicrobial drugs and natural product extracts *in vitro,* (2) formulation and characterization of film-forming solutions, (3) elucidate skin permeation of selected drug, (4) determine antifungal activity and safety profile of topical film forming polymeric spray. Seventy-three (73) formulations were prepared but only 6 formulations were chosen from the pre-formulation studies were further testing. Formulation A was superior to the other tested formulations due dries in less than 1 minute, is non-sticky and forms a transparent film on the skin. The dried film of formulation A has significantly low in tensile strength (4.78 ± 0.14 N/m^2, *p value*<0.05) indicating that it is flexible enough to follow the movement of skin and has a significantly high percentage elongation at break ($13.61^c \pm 2.229$ %, *p value* <0.05) which prevents loss of film through abrasion. Terbinafine HCl content of Formulation A is acceptable according to British Pharmacopoeia specifications. Formulation A showed significantly (*p value*<0.05) the highest (151.038 µg/cm^2) drug permeation across SC at 24 hours and efficacious when compared to rest of the formulations and the proprietary drug [47.578 µg/cm^2, Terbex® (cream formulation)]. Formulation A is a new method for topical antifungal delivery to treat dermatophytosis affecting skin with good patient acceptance for improved compliance, is efficacious, safe and satisfies pharmacopeal standards for product stability.

TABLE OF CONTENTS